REMARKS

The present invention discloses a line light irradiation device in a rectangular casing shown in Figure 1 and is capable of supporting a pair of light sources on opposite ends of the rectangular body having a substantially cylindrically bundled light introducing end portions of optical fibers. A binding part spreads the optical fibers into an array along a straight line or multiple straight lines.

The binding part can be mounted on a bracket member pivotally movable within the holding body and activated from a position exterior of the holding body to permit an adjustment in the alignment of the optical axis of the emitted light. A cylindrical rod lens is appropriately mounted relative to the bracket member to assist in spreading the light along the illumination line. This illumination line is extending relatively traverse to the length of the rectangular body. An upper surface of the rectangular surface has an elongated monitoring bore to enable visual inspection of the object being inspected.

Respective plurality bundles of optical fibers are utilized and lengths of the portions of each of the respective bundle optical fibers are made to be different as shown, for example in Figure 5. The binding parts for holding the light irradiating portions of the optical fibers can be structured to deviate in either one of two direction with respect to a center line of the light irradiating part.

As a result, identical fiber bands can be kept in the production inventory and can be mounted so that their front and back sides are turned relatively upside down relative to adjacent optical fiber bands in the holding body to permit a compact configuration, particularly when stacking the light emitting irradiating parts such as shown, for example in Figure 2 of our drawings.

As can be readily appreciated from the cited art and the requirement of inspecting products such as printed circuit boards, this is a relatively crowded technological field. Numerous engineers and scientists are trying to provide the most economical light monitoring equipment and to improve performance.

> "Thus when differences that may appear technologically minor nonetheless have a practical impact, particularly in a crowded field, the decision-maker must consider the obviousness of the new structure in this light."
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> *Continental Can Co. USA Inc. v. Monsanto Co.*, 20 U.S.P.Q. 2d. 1746, 1752 (Fed. Cir. 1991).

The Office Action raised an issue with regards to the formality of our Claims 1, 5-9 and 13, which is believed to be addressed by our currently amended claims.

The Office Action further contended that Claims 1-5, 10 and 11 were rejected as being obvious over *Conzola et al.* (U.S. Patent No. 5,185,638) in view of *Miller* (U.S. Patent No. 5,268,977).

As set forth in MPEP 2142,

> To reach a proper determination under 35 U.S.C. §103, the examiner must step backward in time and into the shoes worn by the hypothetical "person of ordinary skill in the art" when the invention was unknown and just before it was made. In view of all factual information, the examiner must then make a determination whether the claimed invention "as a whole" would have been obvious at that time to that person. Knowledge of applicant's disclosure must be put aside in reaching this determination, yet kept in mind in order to determine the "differences," conduct the search and evaluate the "subject matter as a whole" of the invention. The tendency to resort to "hindsight" based upon applicant's disclosure is often difficult to avoid due to the very nature of the examination process. However, impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art.

The *Conzola et al.* disclosure is directed to a computer controlled illumination system providing an array of light above a work piece to match the focal point of a camera 24 as shown in Figure 9. A plurality of discreet glass fiber optical bundles were utilized with a circular input bundle face and a rectangular slit output face. The fiber optic faces were arranged at a distance between the centers of adjacent lines corresponded to an angle of incidence of the emitted light.

The alignment of the fibers were purportedly randomized to prevent "a direct correlation between the intensity distribution of the fiber optic input and the output faces." See Column 5, Lines 11-14. The relative intensity illumination settings for the light sources were computer controlled so that by relatively adjusting the light output the control of voltage to the light sources, it was possible to improve the imaging contrast of features on the work piece.

The Office Action cited a "holding body" as equivalent to our claimed invention in Column 8, Lines 32-36. However, the teaching from the *Conzola et al.* reference is as follows:

> The angular placement of this mechanical housing is accomplished by an adjustment of a spring loaded pivoting bracket (not shown).

As can be seen, this citation simply refers to a mechanical housing without any detailed disclosure.

Referring to Figures 10-12, a hexagonal configured line converter schematically discloses a connection with optical fiber bundles 25 so that a stacked array of meniscus lenses 30, cylindrical lenses 31, and a focusing lens 32 is shown. The Office Action further contended on Page 10, that *Conzola et al.* taught in Figure 11, Column 8 Line 55, a cylindrical rod lens. However, Figure 11 does not appear to be a cylindrical rod lens and the teaching in Column 8, Line 55, simply states "the series of cylindrical lenses cemented together." The cylindrical lenses referred to are a stack of rectangular bars presumably with one side of a curved exterior

set of surfaces to match the meniscus lens. They do not teach a relatively inexpensive cylindrical rod lens as described in our invention.

Miller was apparently cited to supplement the missing teachings of a bracket around the light source and a monitoring bore as set forth on Page 4 of the Office Action.

The actual teaching of *Miller* is as follows (citing Column 3, Lines 43-53):

> In FIG. 3 the side cross-sectional view of a fiber optic pinspot luminaire 10 of FIG. 3 is shown, according to the present invention, producing a wide beam. Light emitter 12 is supported by light guide 13, disposed within a support tube 11, which is in turn slidably disposed within a hole 21 within the proximal wall 23 of generally tubular housing 24. Light emitter 12 is moved out of focal plane Fp of the collimating macro lens 15 to a focus zoom position Fz, which is the focal plane of a plurality of integral micro lenses 15a.

As can be determined, the *Miller* reference is more concerned with permitting a zooming movement in a cylindrical bundle of light emitting ends of a fiber optic configuration. Reference can be made to Figures 3-6 to show the consequences of rotation of the support tube 32 within the threaded hole 31 to producing basically a round spotlight. More particularly, such teachings to a person of ordinary skill in this field would be directed to the distal end of the housing where a composite lens formed of a basic macro lens configuration having a plurality of peripheral micro lenses to permit the formation of a principal focus in a first focal plane and a secondary focus with the micro lenses in a second focal plane. The purpose of such a composite lens is set forth in Column 1, Lines 36-42 of the *Miller* patent as follows:

> The primary purpose of the present invention is to provide a fiber optic light guide luminaire having narrow-beam zoomable to a uniformly illuminated wide beam; using a simple, inexpensive lens, in which the beam is free of a harsh edges, fiber images and chromatic aberrations; and which may be dimmed over the full range of zoomed beam widths. (underline added)

Thus, it would appear that the teaching in *Miller* to a person of ordinary skill in this field, would be to provide a relatively cheap fiber optic narrow beam spotlight or "pinspot" path for a residential use that permitted a zooming function to provide a uniformly illuminated wide beam with a simple inexpensive lens.

It is respectfully suggested that this teaching was not only misinterpreted in the Office Action but that a person of ordinary skill seeking to modify a line scan light irradiation device for measuring a surface configuration on a work piece, would not seek the residential pinspot light of a narrow beam configuration taught by the *Miller* disclosure.

Claims 6, 13 and 14 were further rejected as being obvious over a combination of *Conzola et al.,* and *Miller* references when taken further in view of *Windross* (U.S. Patent No. 5,222,794).

The *Windross* reference was cited for a teaching of space efficiency by disclosing various lengths of the fiber optic member with purportedly a "binding (12) part" shown in Figure 1. The *Windross* reference was assigned to Ford Motor Company, and as defined in the specification, purportedly taught a vehicle headlamp. See Column 3, Lines 21-26.

The relied upon citation in the Office Action of Element 12 was actually a large fiber optic cable 12. See Column 3, Lines 28-29. The fiber optic members are displayed within a "block 26" formed of an acrylic or epoxy material to encapsulate the individual optical fibers 14 and to permit the end of the block 26 to be cut and polished for exposing the ends of the optical fibers. See Column 4, Lines 18-22. This arrangement would be consistent with a relatively inexpensive headlight source for a vehicle, but certainly not for the environment of inspecting minute features on a printed circuit board.

Certainly there is no teaching in the *Windross* reference that addresses the binding part features of our present invention as defined in our claims. In addition, the *Windross* reference does not supplement the deficiencies in the *Conzola et al.* and *Miller* disclosures.

Claim 7 was rejected over a combination of *Conzola et al, Miller* and *Biard* (U.S. Patent No. 5,148,303).

Biard was cited to teach a fiber optic device utilizing LEDs. Actually, the *Biard* reference was to teach a delay line fiber optic sensor to be able to measure various properties or parameters in the physical world such as temperature, humidity, pressure, desertion and motion. See Column 3, Lines 30-40.

The sensor element at the end of the fiber could change its reflection coefficient in response to the physical variable being sensed. The *Biard* reference sought to provide a relatively low cost and ease of maintenance for the fiber optical sensor that could share a common decode scheme for different sensors. See Column 2, Lines 41-44.

Thus, the *Biard* reference teaches an LED. It is not in the field of the present invention, nor does it rectify the deficiencies in *Miller* and *Conzola et al.*

Claim 8 was rejected over *Conzola et al., Miller* and *Marcus et al.* (U.S. Patent No. 5,596,409).

The Office Action admitted, on Page 8, that the *Marcus et al.* device measured physical properties of an object and the distance between a lens and an optical fiber could be variable. Actually, the *Marcus et al.* reference was directed to a dual inferometric measurement method wherein non-coherent light and coherent light is structured to share a variable optical path delay element to enable the measurement, for example of thicknesses of various layers of liquids and solids.

It is respectfully submitted that the requirement of supporting an analysis of a combination of diverse multiple patents has not met the requirements under 35 U.S.C. §103 as follows:

> Often, it will be necessary . . . to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. To facilitate review, this analysis should be made explicit.
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> *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1740-41 (2007).

Claim 9 was rejected over *Conzola et al., Miller* and *Wack et al.* (U.S. Patent No. 6,782,337).

The *Wack et al.* reference was relied upon to teach a rotable light source for monitoring defects. The *Wack et al.* reference, however, did not address any of the deficiencies in the *Conzola et al.* or *Miller* references.

Claim 12 was rejected over a combination of *Conzola et al., Miller* and *Poffenbarger* (U.S. Patent No. 5,953,113).

Actually, the *Poffenbarger* reference was directed to an instrument for measuring the production of a fiber optic product as shown, for example in Figure 6, including the steps of displaying a flawed area and then rectifying the problem by removing the flawed area from the fiber optic. The Office Action simply cited *Poffenbarger* for teaching individual light sources to increase the brightness of output illumination.

It would appear that this unrelated combination of art could only have been cited in hindsight from a template of our present application.

> "When prior art references require selective combination by the court to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gleaned from the invention itself."
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> *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1143 (Fed. Cir. 1985).

Referring to Claim 1 amended, our binding part is capable of binding respective light introducing end portions of the optical fibers to a holding body and as configured, the binding part can be located to deviate to either one of two directions with respect to the center line of the light irradiating part and, therefore, enable two identical adjacent optical fiber bands to be mounted with their respective front and back sides turned relatively upside down in the holding body so that the location of the adjacent bending parts can be different, thereby enabling a very compact configuration to the line light irradiation device. See, for example our teachings on Page 11, Lines 14-24 of our specification.

The dependent Claims 2-4 and 7-12 provide additional features not taught nor suggested by the references of record.

Amended Claim 13 also defines the particular structural features of our line light irradiation device in a manner not suggested nor taught by any combination of the references cited.

The respective dependent Claims 14, 16 and 17 add additional features while new Claims 18 and 19 are also directed to features neither taught nor suggested by any of the references of record.

As can be readily appreciated, the binding parts and their relationship, including the holding body with a monitoring bore, are not set forth nor suggested by any combination of the references.

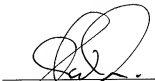
Additionally, the configuration of the holding body with a rectangular body and the mounting of the plurality of separate light sources, along with a bracket member to permit adjustment is not found in any combination of the references.

In view of the amendment to the present claims, it is believed that the case is now in condition for allowance and an early notification of the same is requested.

If the Examiner believes that a telephone interview will help in the prosecution of this matter, the undersigned attorney can be contacted at the listed phone number.

Very truly yours,

SNELL & WILMER L.L.P.



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